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TUBERCULOSIS IN CATTLE AND HOGS.

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Bovine tuberculosis is a menace that no stock raiser or dairyman can afford to ignore. Over twenty per cent of one thousand cows, recently tested in seven different counties in the San Joaquin Valley, reacted to the test, and were condemned. Furthermore, the disease is increasing. Figures from the reports of meat inspectors in San Francisco show that the number of cattle coming from this valley, which are affected with tuberculosis, has increased from nine tenths of 1 per cent to 9 per cent in five years. The economic losses from the disease are enormous, amounting to over half a million dollars per year in this State alone.

The loss of human life due to tuberculosis contracted from infected animals is of infinitely greater consequence than the tremendous economic loss. Scientific investigations indicate that a certain percentage of human tuberculosis is of bovine origin, the germs being readily transferable through the milk, butter, and improperly cooked flesh of infected animals.

The disease is readily transmitted from cattle to children when infected cows' milk is largely used as food. It is admitted by the best authorities that intestinal tuberculosis, skin-tuberculosis, and bone-tuberculosis of man, are often of bovine origin; researches by Dr. Park of the New York City Board of Health indicate that about 12 per cent of the total infections from tuberculosis in children are due to infection from bovine sources.

Symptoms of Tuberculosis in Cattle.

There is no symptom that can be relied upon as a certain indication of the disease, since each may in some cases be caused by other diseases or conditions. Following are the more frequent symptoms which may possibly indicate tuberculosis in cattle:

Loss of Flesh and Unthriftiness.—The coat becomes rough, the skin feels harsh and thick and there is a gradual loss of flesh without a loss of appetite.

Cough.—This symptom is only present when the disease is attacking the lungs or some part of the breathing organs. It is not a loud cough, but rather a subdued and infrequent one, and may at first be heard only when the animal is driven. At a later stage of the disease it may be heard at any time of the day. Cows do not usually appear to cough up anything. This is because they do not spit. Most of the material coughed up from the lungs is swallowed, but many tuberculosis germs

escape from the mouth in the form of spray, or are discharged from the nose. Symptoms of lung infection other than cough are wheezing or snoring respiration and labored breathing on being exercised.

Enlarged Glands.—Enlargements in the region of the throat, especially when they cause difficulty in breathing, are very apt to be due to tuberculosis.

Loss of Appetite.—This symptom is not seen until the later stages of the disease, when the animal is evidently wasting.

Bloating.—Sometimes the diseased glands in the chest prevent the usual passage of gas from the paunch to the mouth by pressing on the gullet. In this case the cow suffers from bloating, and the paunch is often greatly distended with gas. This, however, is not a very frequent symptom.

Diarrhea.—Looseness of the bowels or "scouring" is seen in cattle affected with the disease in the bowels. This kind of scouring cannot be cured by any known treatment.

Hard Lumps in the Udder.—When tuberculosis attacks the udder no change can be detected at first, but after a time hard lumps can be felt in some parts of the organ after it is milked out. Milk from such an udder must not be used, as it is almost certain to be teeming with germs of the disease.

Post-mortem Appearances.

When the carcass of the cow affected with tuberculosis is opened the disease may be found in any part of the body, but it is usually located in the lymph glands of the chest, throat, or abdomen. Tissues showing lesions of tuberculosis in cattle and hogs can be seen in the veterinary exhibit of the College of Agriculture at Berkeley and Davis. When the disease is located in the lungs and discharges into the air tubes, pieces of diseased tissue and millions of germs are liberated and coughed up. Most of these are swallowed and passed out in the manure. This is the chief way in which the germs are discharged from diseased cattle.

Suppression of the Disease.

The first step in getting rid of the disease is to find out how many of the herd are affected by it. This is done by applying the tuberculin test. This will show a larger or smaller number of the herd to be affected, and the proper course to pursue will depend largely upon the proportion of the reactors found.

Suppose that only a few cattle react, say 15 out of 100, or in that proportion. In this case the reactors are first carefully examined, and if any of them show symptoms of the disease by coughing, loss of condition, or any other of the signs by which the disease is recognized without the test, such animals should be slaughtered.

The other reactors should then be entirely separated from the healthy cattle, and fed, watered, and kept separate from the other animals at all times. Whenever a calf is born among the reactors, it should be imme-

diately separated from its mother and brought up by hand, or on a healthy cow. The calf is usually born healthy, but would soon catch the disease from its mother if allowed to remain with her.

The milk of reacting cows may be used if it is first boiled or heated to a point sufficient to kill the germs. This heating to a point less than boiling is called pasteurizing, and is safe, provided all the milk reaches the required degree of heat and is kept there sufficiently long. Heat the milk to at least 160 degrees F. and allow it to cool gradually. Then feed to the calves without being mixed with other milk.

This system of dealing with tuberculosis in a herd was planned by Professor Bang of Denmark and has been very successfully followed in that country for some years. It has the advantage of allowing the reactors to be made use of while a sound herd is being built up. Under this system the sound herd increases in numbers as healthy calves are added to it, while the diseased herd becomes smaller as the reactors die off or are killed as open cases of tuberculosis.

Dealing With a Badly Infected Herd.

Where the test shows more than half the number diseased, a somewhat different plan is required than the Bang system. This herd is so badly affected that the non-reactors cannot safely be considered healthy. Many of them are sure to have been infected with the disease quite recently, so that the test fails to detect it. These will react at the next test, and in the mean time may develop the disease so rapidly as to infect the others.

For these reasons it is better to treat such a herd as if it were entirely diseased, and to begin with the newborn calves to building up a healthy herd. The method from this point is exactly the same as the Bang system, except that, as there are no healthy cows to act as foster mothers, the calves must be raised on pasteurized milk. At 6 months old the calves are tested, and reactors are transferred to the other herd. This plan was devised by a German veterinary surgeon named Ostertag, and is known as the Ostertag system. It is very successful when carefully carried out.

While getting rid of the disease by whatever system may be adopted, an animal should never be bought for the healthy herd unless known to be healthy. The tuberculin test should be applied, and if possible the animals should be selected from a herd that is known to be free from tuberculosis.

Sanitation.

In at least one respect the problem of dairy sanitation is not as great in California as in many other parts of the United States. The proper ventilation of stables is not a great problem here. The climatic conditions are such that tight barns are unnecessary, and the cows can live in the out-of-doors for a greater length of time than in the eastern states. Although this out-of-door life may be of value in lessening the amount of tuberculosis, it will not absolutely prevent its spread. In dairy cows

kept under outdoor conditions, tuberculosis is common. Even in the range cattle of this State the disease seems to be increasing.

Cleanliness.

Since the manure of tuberculosis cattle often contains living tubercle germs in vast numbers, the importance of keeping it well cleaned from the stable and yards is readily seen. Such manure is not only dangerous to other cattle in the stable, but may be the means of conveying the disease to children. Often cows are seen with their flanks incrusted with dry dung. Parts often break off while the cow is milked, and some of it is likely to fall into the milk pail. The larger lumps are strained out, but the smaller particles remain, and also the tubercular germs, which are small enough to pass through the strainer. These stay in the milk and make it a fruitful cause of the disease in young children.

Stables should be cleaned out often and the manure put where it can not be picked over by hogs or cattle. Hogs are easily infected in that way. Cleanliness also includes keeping the walls and ceilings free from dirt, dust and cobwebs. These are all good resting places for disease germs.

The Dairyman's Responsibility.

The eradication of tuberculosis is the task of the dairyman with the assistance of the State. The responsibility for the existence of tuberculosis and its continuance rests with the owners of the infected cattle. Remarkable progress has been made in eradicating tuberculosis without great loss in several dairy sections of this State. The men above all others who should regularly test their cows are the ones whose herds are free from the disease. Constant vigilance is necessary to keep a herd of dairy cows free from tuberculosis.